REMARKS

Claims 19-43 are pending in the application; the status of the claims is as follows:

Claims 19, 21, and 34-43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,539,268 to Kataoka ("Kataoka") in view of U.S. Patent No. 5,870,634 to Sugaya et al. ("Sugaya").

Claims 20, 22, and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the references as applied to the claims above, and further in view of U.S. Patent No. 6,812,618 B2 to Hayashi et al. ("Hayashi").

Claims 19-23 and 34-43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayashi in view of Sugaya.

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the references as applied to claim 19 above in numbered paragraph 3 or 5 of the Office Action, and further in view of U.S. Patent No. 6,437,481 B2 to Senda et al. ("Senda").

Claims 25-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the references as applied in numbered paragraphs 3 or 5 above of the Office Action, and further in view of U.S. Patent No. 6,512,321 B2 to Yoshida et al ("Yoshida").

35 U.S.C. § 103(a) Rejections

The rejection of claims 19, 21, and 34-43 under 35 U.S.C. § 103(a), as being unpatentable over Kataoka in view of Sugaya, is respectfully traversed based on the following.

Kataoka shows a vibration type actuator device. A pulse generator (PG 11) drives piezoelectric elements 1 and 2. The pulse generator is controlled by a pulse width control signal (PS) and a frequency command signal (FS). The frequency command signal

controls the frequency of oscillator 12. These two signals are generated by CPU 14 according to the algorithm illustrated in Figure 2. As noted in the Summary of the Invention section (col. 2, lines 30-47):

> [A] vibration type actuator, which comprises a first control circuit for controlling the value of the first parameter in accordance with a driving state of the actuator, and a second control circuit for controlling a value of a second parameter (e.g., a frequency) of first and second parameters for determining a driving force of the vibration type actuator, so that a value of the first parameter (e.g., a driving pulse width) becomes a predetermined value, and which has a wide control range and resists any disturbance.
>
> One aspect of the application is to provide a vibration type actuator device in which a driving pulse or a pulse phase difference as *the first parameter is controlled by the second control circuit in accordance with a driving speed of a driven member* driven by the actuator which achieves the above-mentioned object, and the *value of the second parameter is controlled by the first control circuit in accordance with the difference between the value of the first parameter and the predetermined value.* (*italics added*)

Thus, the non-frequency parameter (pulse width or phase difference) (col. 4, line 44 – col. 5, line 12) is set by a command PS in accordance with the driving speed. The frequency command FS (col. 6, 17-29) is then determined based on the difference between the pulse width according to PS and a predetermined pulse width P_0 (col. 5, lines 51-60). Thus, both the frequency and the pulse width are varied to achieve the desired velocity V_s and drive the actuator to the desired goal position TP (col. 4, lines 7-22).

Suguya shows an anti-blur mechanism for a camera. A vibration motor 10 is used to counteract vibration to the camera. The position and angular velocity (col. 10, lines 67 – col. 11, line 4) are determined and processed (Figure 10) to determine the commands (col. 11, lines 11-15) for the vibration motor to counteract the vibration.

In contrast to the cited references, claim 19 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

Neither of the cited references shows or suggests setting a driving frequency and then determining a non-frequency parameter necessary to pursue a target position. In fact, Kataoka teaches the opposite, the first parameter is determined and then the second parameter (frequency) is then adjusted in light of the predetermined first parameter. To support a *prima facie* case for obviousness, the combined references must show or suggest every limitation of the claim. MPEP §2143.03. Therefore, because none of the cited references show or suggest the cited limitations, claim 19 is not obvious over the cited references. Claim 21 is dependent upon claim 19 and thus includes every limitation of claim 19. Therefore, claim 21 is also not obvious over the cited references.

Also in contrast to the cited references, claim 34 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position, wherein a frequency of the drive signal is maintained within a predetermined frequency range.

As noted above, neither of the cited references show or suggest setting a driving frequency and then determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 34 is not obvious over the cited references. Claims 35-37 are dependent upon claim 34 and thus include every limitation of claim 34. Therefore, claims 35-37 are also not obvious over the cited references.

Also in contrast to the cited references, claim 38 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above, neither of the cited references show or suggest setting a driving frequency and then determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 38 is not obvious over the cited references. Claims 39-41 are dependent upon claim 38 and thus include every limitation of claim 38. Therefore, claims 39-41 are also not obvious over the cited references.

Also in contrast to the cited references, claim 42 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above, neither of the cited references show or suggest setting a driving frequency and then determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 42 is not obvious over the cited references. Claim 43 is dependent upon claim 42 and thus includes every limitation of claim 42. Therefore, claim 43 is also not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 19, 21, and 34-43 under 35 U.S.C. § 103(a) as being unpatentable over Kataoka in view of Sugaya, be reconsidered and withdrawn.

The rejection of claims 20, 22, and 23 under 35 U.S.C. § 103(a), as being unpatentable over the references as applied to the claims above, and further in view of Hayashi, is respectfully traversed based on the following.

Hayashi shows a control apparatus for a vibration type actuator. A frequency command corresponding to a selected speed is issued by a speed control block 3. For each selected frequency, a corresponding optimal pulse width PW is stored in a table in memory. This optimal pulse width is used to optimize the speed vs. frequency characteristics of the device (col. 4, line 65 – col. 5, line 11).

In contrast to the cited reference, claim 19 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

Hayashi controls the speed of the actuator solely using frequency and uses the pulse width that is optimal to the selected frequency. Hayashi does not show or suggest using any parameter other than frequency to control the speed of the actuator. Thus, Hayashi does not show or suggest controlling a "non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position." As noted above, the other cited references also do not show setting a basic frequency and varying a non-frequency parameter based on the present position and a target position. Therefore, none of the cited references, show or suggest the cited limitation and the cited references do not support a *prima facie* case for obviousness. Claims 20, 22, and 23 are dependent upon claim 19, and thus include every limitation of claim 19. Thus, claims 20, 22, and 23 are not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 20, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over the references as applied to the claims above, and further in view of Hayashi, be reconsidered and withdrawn.

The rejection of claims 19-23 and 34-43 under 35 U.S.C. § 103(a), as being unpatentable over Hayashi in view of Sugaya, is respectfully traversed based on the following.

As noted above, neither cited reference shows or suggests as claimed in claim 19:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

Therefore, claim 19 is not obvious over the cited references. As also noted above, claim 20, 22 and 23 are dependent upon claim 19 and include every limitation of claim 19. Therefore, claims 20, 22, and 23 are also not obvious over the cited references.

Also in contrast to the cited references, claim 34 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position, wherein a frequency of the drive signal is maintained within a predetermined frequency range.

As noted above, neither of the cited references show or suggest determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 34 is not obvious over the cited references. Claims 35-37 are dependent upon claim 34 and thus include every limitation of claim 34. Therefore, claims 35-37 are also not obvious over the cited references.

Also in contrast to the cited references, claim 38 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above, neither of the cited references show or suggest determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 38 is not obvious over the cited references. Claims 39-41 are dependent upon claim 38 and thus include every limitation of claim 38. Therefore, claims 39-41 are also not obvious over the cited references.

Also in contrast to the cited references, claim 42 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

As noted above, neither of the cited references show or suggest determining a non-frequency parameter necessary to pursue a target position. Therefore, because none of the cited references show or suggest the cited limitations, claim 42 is not obvious over the cited references. Claim 43 is dependent upon claim 42 and thus includes every limitation of claim 42. Therefore, claim 43 is also not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 19-23 and 34-43 under 35 U.S.C. § 103(a) as being unpatentable over Hayashi in view of Sugaya, be reconsidered and withdrawn.

The rejection of claim 24 under 35 U.S.C. § 103(a), as being unpatentable over the references as applied to claim 19 in numbered paragraphs 3 (Kataoka in view of Sugaya)

or 5 (Hayashi in view of Sugaya) of the Office Action, and further in view of Senda, is respectfully traversed based on the following.

Senda shows that the speed to frequency response of a piezoelectric device varies with temperature (Figure 2), and shows a mechanism is shown for compensating for this temperature variation (col. 6, lines 9-16).

Claim 19 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

However, as noted above, Kataoka, Hayashi and Sugaya do not show or suggest the quoted limitation of claim 19. Senda also does not show or suggest this limitation. Claim 24 is dependent upon claim 19 and thus includes every limitation of claim 19. Therefore, the cited references do not show or suggest every limitation of claim 24 and claim 24 is not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claim 24 under 35 U.S.C. § 103(a) as being unpatentable over the references as applied to claim 19 in numbered paragraphs 3 or 5 of the Office Action, and further in view of Senda, be reconsidered and withdrawn.

The rejection of claims 25-33 under 35 U.S.C. § 103(a), as being unpatentable over the references as applied in numbered paragraphs 3 (Kataoka in view of Sugaya) or 5 (Hayashi in view of Sugaya) of the Office Action, and further in view of Yoshida, is respectfully traversed based on the following.

Yoshida shows an ultrasonic piezoelectric motor (Figure 2) similar to that shown in Figure 2 of this application. The driving frequency fd is set at a frequency lower than the resonant frequency of the motor (*e.g.* col. 7, lines 6-10).

Claim 19 includes:

> a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

However, as noted above, Kataoka, Hayashi and Sugaya do not show or suggest the quoted limitation of claim 19. Yoshida also does not show or suggest this limitation. Claims 25-27 are dependent upon claim 19 and thus includes every limitation of claim 19. Therefore, the cited references do not show or suggest every limitation of claims 25-27 and claims 25-27 are not obvious over the cited references.

In contrast to the cited references, claim 28 includes:

> a position servo controller which sets a frequency of the drive signal to a frequency lower than a complete resonant frequency of the ultrasonic actuator, and which controls a first non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

None of the cited references show or suggest a servo controller that "sets a frequency of the drive signal" and "controls a first non-frequency parameter of the drive signal based on a difference between the present position and the control target position." Therefore, the combined references do not show or suggest every element of the claim and thus claim 28 is not *prima facie* obvious over the cited references. Claims 29-33 are dependent upon claim 28 and thus include every limitation of claim 28. Therefore, claims 29-33 are also not obvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claims 25-33 under 35 U.S.C. § 103(a), as being unpatentable over the references as applied in numbered paragraphs 3 or 5 of the Office Action, and further in view of Yoshida, be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee,

and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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